

## CLAIMS

1. A process for producing a carbonyl compound,  
comprising allowing water to undergo phase transition to a  
5 supercritical or subcritical state in the presence of an alcohol  
compound to produce/generate water-derived hydrogen and at the same  
time convert the alcohol compound into a corresponding carbonyl  
compound.
2. A process for generating water-derived hydrogen,  
10 comprising bringing water into a critical state in the presence of  
a secondary alcohol.
3. The process according to claim 2, wherein the process  
is carried out by introducing the secondary alcohol in a reaction  
tube along with water and heating and/or pressurizing the mixture  
15 of the alcohol and the water to bring the water into the  
supercritical state.
4. The process for producing hydrogen according to claim  
2 or 3, wherein the phase transition of the water to the  
supercritical or subcritical state is carried out in an oxygen-free  
20 environment.
5. The process for producing hydrogen according to claim  
4, wherein the oxygen-free state is established by removing oxygen  
from the atmosphere in the reaction system.
6. The process for producing hydrogen according to claim  
25 4, wherein the oxygen-free state is established by using  
deoxygenated water.
7. The process for producing hydrogen according to claim  
4, wherein the oxygen-free state is established by removing oxygen  
from the atmosphere in the reaction system while using deoxygenated  
30 water.
8. A novel process for producing a carbonyl compound,  
comprising reacting a primary or secondary alcohol with subcritical  
or supercritical water to convert the alcohol into a carbonyl

compound.

9. The process according to claim 8, wherein the process is carried out by introducing the primary or secondary alcohol in a reaction tube along with water and heating and/or pressurizing the  
5 mixture of the alcohol and the water to bring the water into the subcritical or supercritical state.

10. The novel process for producing a carbonyl compound according to claim 8 or 9, wherein the reaction of the primary alcohol or the secondary alcohol with the subcritical or  
10 supercritical water is carried out in an oxygen-free environment.

11. The novel process for producing a carbonyl compound according to claim 10, wherein the oxygen-free state is established by removing oxygen from the atmosphere in the reaction system.

12. The novel process for producing a carbonyl compound  
15 according to claim 10, wherein the oxygen-free state is established by using deoxygenated water as the water to be brought into the subcritical or supercritical state.

13. The novel process for producing a carbonyl compound according to claim 10, wherein the oxygen-free state is established  
20 by removing oxygen from the atmosphere in the reaction system while using deoxygenated water as the water to be brought into the subcritical or supercritical state.